Premier's Advisory Council on Innovation

Interim Report of Council

106-00645/

Message from the Council Chair

Dear Premier Hamm

As Chair of the Premier's Advisory Council on Innovation, I am pleased to submit the following Interim Report of Council. This first report represents a synopsis of the recommendations that flow from Council's activity since inception. Appendices upon which the recommendations are based are available for your review, and I would welcome an opportunity to meet with you and your officials to present them in more detail.

The establishment of Council together with the release of the province's innovation policy in June of 2003 demonstrated the government's recognition that innovation is always key to economic success. Only those societies that are truly innovative can provide their citizens with a high quality of life over the long term. During the past two years, the province has made progress toward building this type of supportive socio-economic environment in Nova Scotia. But more progress is needed relative to other jurisdictions, and that is where I believe Council can help. It is my hope that the following recommendations will stimulate progress toward a more innovative society resulting in benefits felt widely throughout the community.

To be innovative requires decision-making, leadership, and focus. Nova Scotia must not diminish the benefit of our resources and capacities by spreading them too thinly. In the absence of broadly based economies of scale, a focus is required. I believe that government can provide the critical catalyst for economic development by identifying a strategic direction, and by using specific levers such as procurement and taxation policy, to help drive development within the chosen focus.

I would like to take this opportunity to acknowledge the dedication, skill, and hard work of my Council colleagues – volunteers all, who sense a window of opportunity to serve their fellow Nova Scotians. It has been my great pleasure over the past two years to Chair such a group and to participate in a process that has generated serious thought and debate. I look forward to expanding on what has been a very positive process thus far. I would also like to extend my appreciation to you and your government for your ongoing support. Innovation Councils are relatively few in this country, and none existed in Nova Scotia before your government created this one. By putting the focus on innovation, you do service to the link that has been proven to exist in all successful jurisdictions between innovation, entrepreneurial ability and wealth-creation.

Council is committed to providing on-going reports that delve deeper into the drivers of innovation and economic development that are most suited to this province. We anticipate that each successive set of recommendations will reflect a growing belief among Nova Scotians that they can be, and indeed in many ways already are, successful innovators. We look forward to your earliest response to this, the first report of Council.

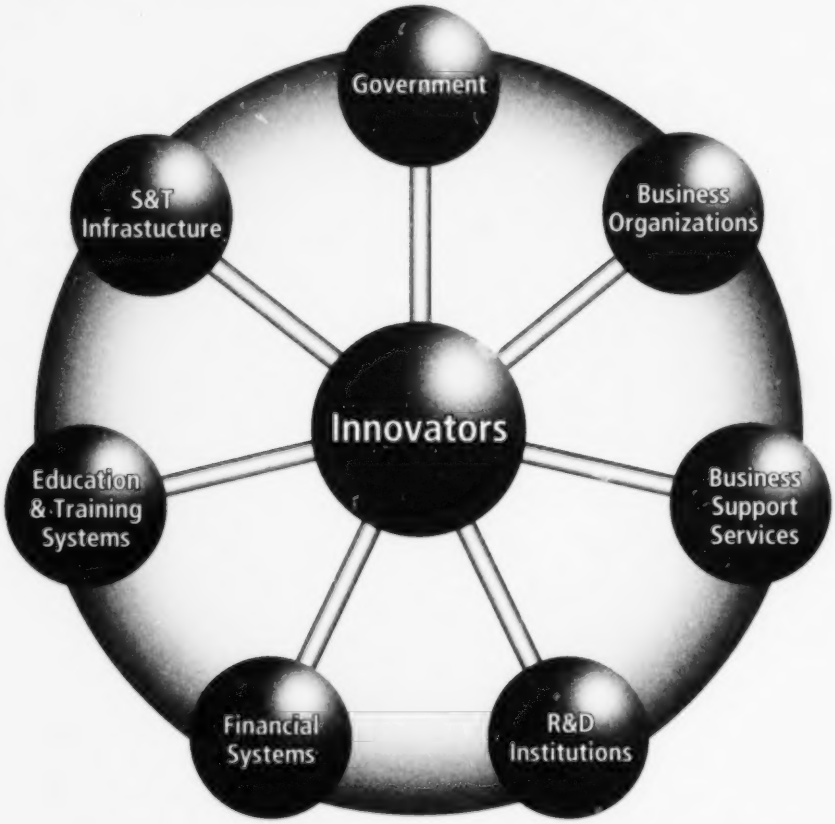
Sincerely,

Kelvin Ogilvie, C.M., Ph.D., D.Sc., H.Col., F.C.I.C
Chair, Premier's Advisory Council on Innovation

1.0 Introduction

The Premier's Advisory Council on Innovation was established in June 2003 in conjunction with the release of the provincial innovation policy, *Innovative Nova Scotia*, whose broader objective is to "enable innovators by strengthening the innovative systems that are integral to the innovative process." Establishing the Premier's Advisory Council on Innovation became a key mechanism to help forge these stronger linkages among the various components of the innovation system. (See figure 1)

Figure 1: The Innovation System



Council consists entirely of volunteers, including the Chair. The members bring a wide range of talents and specialties from very diverse sectors and affiliations. (See Appendix 1 for Council Membership). Council members have maintained an active schedule of meetings and external discussions since they began their work.

Council's mandate is to "*Provide independent advice and direction to government to help maximize the economic and social benefits enhanced innovation offers to Nova Scotians.*" Early on Council agreed on a definition of innovation that allowed for sufficient latitude to facilitate a broad range of Council activities and directions. *"Innovation is the successful implementation of new ideas".* Within this context Council members agreed upon six key areas of specific focus and activity:

1. Strategic Focus for Economic Development
2. Taxation
3. Information and Communications Technology (ICT)
4. Youth Innovation and Entrepreneurship
5. Community Innovation Networks
6. Research Infrastructure

The report that follows includes a specific recommendation on taxation-related issues that has been formulated by Council as a whole. The balance of the report is a synopsis of the work of five sub-groups or Mandate Groups set up by Council to explore the other five areas of specific focus in further detail.

Each Mandate Group is chaired by a member of Council, with group membership drawn from within Council and also from external sources. The Mandate-Group structure and process is not meant to limit the overall scope of Council. Rather, it provides an approach that has allowed for more in-depth Council attention to specific areas of interest.

Mandate Group reports have been prepared and brought before the full Council for discussion and approval. In the case of the Research Infrastructure Mandate Group, recommendations were provided in September 2004, in response to a specific request from the Premier for Council advice on the development of strategic priorities to guide future Government of Nova Scotia investments in research and development The group's report provided the basis for the development of the Council response that was issued to the Premier in October 2004.

The current document is an initial report of Council's overall activities since inception. Subsequent reports will be forthcoming on a regular basis, on the innovation-related drivers of the economy that are most suited to the Province of Nova Scotia.

2.0 Mandate Group Reports and Recommendations

2.1 Strategic Focus for Economic Development: Investing in Environmental Technologies across the Economy

The environment focus is the specific mandate area of the Council Chair.

The value of choosing a strategic theme to drive economic development beyond normal growth is well established. The province has correctly identified innovation as a critical requirement for our social and economic development. But what is absolutely essential is that we develop a long-term strategic and encompassing focus for the province, and shorter-term objectives consistent with the focus.

Unless we soon identify a strategic focus, and build where we have the broadest knowledge base, our province and indeed our region will fall behind in quality-of-life opportunities, relative to other advanced regions of this continent and world.

Nova Scotia's aspirations for economic growth and prosperity for its citizens can best be achieved by adopting a province-wide focus that offers opportunity for application of all the great strengths and resources of the province. The environment is an encompassing focus within which reachable targets, goals and benchmarks can be set that will help drive economic development, utilize a broad existing economic and R&D base, and support cluster development. The recommendations of the other Mandate Groups are totally consistent with a provincial strategic focus and in fact can best be achieved within that framework.

Recommendations

The Government of Nova Scotia should consider setting the following specific target:

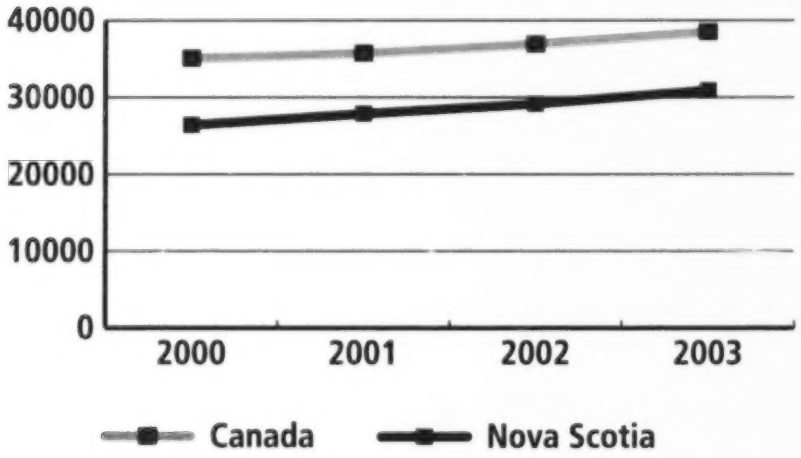
- By 2025, by focusing on environmental technologies and investment, Nova Scotia will have the cleanest and most sustainable environment in the world.

To ensure that this target truly benefits society, it must be tied directly to the following measurable objective:

- By 2025, Nova Scotia will have a GDP per capita equal to or above the Canadian average.

The government's economic growth strategy since 2000 has been paying off in terms of balanced budgets, employment growth and participation rates in the labour force. Growth in the GDP was even above the national average in the years 2001 and 2002. However, there remains a considerable gap between Nova Scotia's GDP per capita when measured against other Canadian jurisdictions. In these relative terms, Nova Scotia has some catching up to do when it comes to this key prosperity measurement, of GDP per capita.

Figure 2: GDP per capita



Nova Scotia ranked eighth among **provincial** jurisdictions for both 2002 and 2003, the two most recent years where data is available. In 2003, Nova Scotia's GDP per capita was approximately 75% of the Canadian average.

As figure 2 illustrates, the GDP-per-capita gap between the Canadian average and Nova Scotia has been relatively consistent over the 2000-2003 period.

Using GDP per capita as a lone benchmark measure has limitations, as does the use of any single measurement. We use it here as a widely accepted, assessable and relatively clear point of reference for gauging general economic progress.

With the above in mind, it is recommended that the Government of Nova Scotia consider setting the following benchmark goals to measure success in the longer term:

- By 2010, Nova Scotia's GDP per capita will be at 80% of the Canadian average.
- By 2015, Nova Scotia's GDP per capita will be at 85% of the Canadian average.
- By 2020, Nova Scotia's GDP per capita will be at 90% of the Canadian average.
- By 2025, Nova Scotia's GDP per capita be equal to or above the Canadian average.

In order to reach these benchmark goals, it is further recommended that the Government of Nova Scotia should consider:

- Setting in motion the development and adoption of an economic-development plan beginning with a forecasting exercise/sector analysis using this Mandate Report as a key reference guide. This should be a high priority exercise aimed at incorporation of the forecast findings into the next update of the Provincial Growth Strategy *Opportunities for Prosperity* document. It must be done in a timely manner.
- Developing a business plan detailing the overall target objectives and laying out a specific and clear plan for achieving the objectives. This includes identifying champions within government and the wider society.

2.2 Taxation Recommendations

As noted in the Introduction, along with Mandate-Group recommendations, specific recommendations related to taxation were discussed and advanced by Council as a whole.

The focus of Council in this case was on the application of possible changes to provincial tax policy as a lever for advancing innovation and economic-growth objectives. Council is of the opinion that marginal tax advantages have limited value in attracting innovative companies to Nova Scotia and in encouraging existing Nova Scotia businesses to enhance their competitive positions.

Council believes that innovative use of tax-policy changes to help advance business R&D activity in Nova Scotia is of fundamental importance. Council has focused on one specific area where it feels an innovative tax change will have negligible impact on overall government tax revenues while offering a significant positive impact on knowledge-based business development.

Building improved business R&D capacity has been identified as a key innovation and commercialization challenge by virtually all government jurisdictions in Canada. Nowhere is this challenge more pronounced than in Atlantic Canada generally and Nova Scotia specifically.

Nova Scotia has consistently ranked 6th among provincial jurisdictions with respect to the level of R&D expenditures by business over the last four years, where data is available (1998-2001).

A number of factors contribute to the level of business R&D activity in any given jurisdiction. Perhaps the most important and most difficult to address are the structural factors related to the size and type of firms within a given economy (predominate sectors/branch-plant versus head-office operations etc). Taxation policy is raised and advanced by Council as a potentially high-impact mechanism that is well within provincial control to change.

Recommendations

It is recommended that the Government of Nova Scotia consider making the following change to the current provincial R&D tax credit:

- Increase the provincial component of the scientific research and development (SR&D) tax credit from the current level of 15% to 40%. The fully refundable nature of the credit should be maintained.

In 1984 the Government of Nova Scotia implemented a 10% non-refundable corporate tax credit on eligible Nova-Scotia incurred expenses under the Government of Canada SR&D tax-credit system. In 1994 the provincial credit was subsequently increased to 15% and made fully refundable. The 15% credit level is fairly consistent amongst most provincial jurisdictions, with some exceptions. The most notable exception is Quebec, which offers a generous package of credits, up to a maximum of 40%, on expenditures related to a number of areas, including research-related salaries and wages and collaborative research carried out by public research institutions.

> In the view of Council, any move which can help to differentiate Nova Scotia as a leader in its tax treatment of business undertaking R&D would be a positive and very important step forward towards enhancing a key component of our provincial innovation system.

An increased R&D tax-credit rate would provide increased incentive for existing Nova Scotia businesses to expand current R&D activities and at the same time provide a major incentive for R&D-intensive firms to relocate to the province.

Council will be pleased to provide additional advice with regard to expenses qualifying under the R&D tax schedule.

2.3 Information and Communications Technology: Doing More with ICT

Information and Communications Technologies (ICT) have become standard tools to support the innovation process, enabling the rapid acquisition, storage and transfer of knowledge. ICT can also provide the means to create and share the other critical but less tangible elements of innovation such as inspiration, motivation and determination.

The focus within ICT recently shifted toward broadband access. While expanded availability is important, this is only one element of a successful strategy for the exploitation of ICT in the innovation process. Nova Scotia's ability to increase its quality of life will be determined more by how we use ICT, rather than how much we use it. Making broadband more available will give access to the tools but will not necessarily provide the skill required to reap benefits.

Nova Scotia is in the leadership ranks in the deployment and penetration of broadband access. The next logical step, then, is to continue to grow our capabilities to exploit this valuable infrastructure. The Internet is a primary platform to support innovation, but it is only one of the capabilities necessary to make innovation a reality.

To compete and lead, Nova Scotia must innovate as efficiently as those in any other jurisdiction. We must become proficient in finding critical data and using it knowledgably. We must develop a sense of what we need to learn, when we need to learn it, and how to satisfy these demands through the effective use of ICT.

Recommendations

It is recommended that the Government of Nova Scotia consider:

- Continuing to bridge the digital divide by supporting community-led initiatives that seek to expand broadband service.
- Expanding community outreach programs to introduce the benefits of e-commerce to small and medium-sized businesses.
- Leveraging the province-wide public and private ICT infrastructure already in place, to expand government service delivery such as healthcare, electronic dispensary, education and business services. (Nova Scotia has played a leading role since 1996 in helping to expand access to ICT in communities though the support of public access sites in schools and libraries throughout the province).
- Determining benchmarks and metrics for ICT penetration and utilization and regularly evaluating against those.

- ➤ Updating education and training curriculums to include best practices and methodologies that enable efficient innovation.
- ➤ Taking full advantage of current government ICT-related procurement to help build ICT skill capacity in the province and increased employment opportunities for Nova Scotians.

2.4 Youth Innovation and Entrepreneurship: Engaging Youth

The development of youth entrepreneurship and innovation lies at the core of our economic development and employment strategy. If we need entrepreneurs and innovative thinkers, we need to invest early in our next generation of talent. This investment needs to occur not only in the courses taught in school, but in the development of open approaches to career paths and attitudes reflecting the positive potential that exists for achieving success in this region.

While research illustrates a number of common themes across the country, Nova Scotia faces several unique challenges to its economic and social well being in the coming years. These challenges are serious. They have been well-documented elsewhere, including by the provincial government:

1. Our students are falling behind in the science and technology sector.
2. The rural-urban mix creates additional complexity.
3. We need to tackle attitudinal hurdles and lack of visible role models in Nova Scotia.
4. Out-migration will continue to be a threat if we do not improve opportunities for new graduates.
5. Demographics and a weak track record on immigration threaten our future supply of talent.

The approaches for addressing these challenges suggested below clearly support the need for a provincial strategic economic focus.

Recommendations

It is recommended that the government consider:

- Investing in K-12 educational programming that instills an interest in entrepreneurial activities, science, technology and innovation.
- Helping students and their parents understand the true labour market for these skills, and supporting programs aimed at improving the number of high school graduates entering these programs in our universities and community colleges.
- Ensuring that programs that instill and support curiosity and mentoring in entrepreneurship and innovation are supported by the province and industry (e.g. Shad Valley, Discovery Centre, Junior Achievement, Techsploration).
- Investing in programs that help youth find employment in their communities across Nova Scotia, given that almost half of our population resides in rural areas, and dovetailing these initiatives with regional economic development programs.
- Investing in the promotion of Nova Scotia as a place to build a career in science, technology, innovation and entrepreneurial business ventures.
- Investing in programs to address the specific needs of under-represented and disadvantaged groups, as well as the needs of our rural communities.
- Removing barriers and creating incentives for individuals who wish to pursue careers in science, technology, engineering, innovation and entrepreneurial pursuits in Nova Scotia.
- Improving the educational readiness of our current youth population for the entrepreneurial and innovation economy, and increasing efforts to attract and retain immigrants in this province.
- Seeking further research into the opportunities available to new graduates.
- A key initiative should be directed toward the retention and employment of students, including foreign students, by removing barriers to them finding work following graduation.

2.5 Community Innovation Networks: Supporting Innovation at the Grassroots

The definition of innovation used by the Community Innovation Networks Mandate Group was very broad in scope. It included not only the creation of new ideas but also the application of existing ideas in different ways. The end result could be new products or techniques in a sector or field a business may already be involved in: i.e. not inventing the wheel, but using it in new ways.

In order to compete in today's knowledge economy innovators must start with good basic education. Specialized skills are required to undertake research and development.

The government needs to ensure that the money spent on research supports the whole province and according to the benefit it has for the economy.

Small-and medium-sized enterprises (SMEs), many of which are rural-based, benefit more from college/university knowledge-based spillover than larger firms that have the capacity to undertake their own research. Almost half of the Nova Scotia population lives in rural areas and more than half the province's university and community college enrollments are in rural towns.

It has been stated that innovative capabilities are best sustained through regional communities that share a common knowledge base. The Caledon Institute says in "Innovation and CED: What they Can Learn From Each Other," that success is often thought to come from harnessing the knowledge and information of a community. And we concur.

Recommendations

In order to further develop the innovative capacity of Nova Scotian communities, it is recommended that the Government of Nova Scotia consider:

- Continuing to support Community Literacy Programs and maintain the Adult Learning Program of the Nova Scotia Community College, which provides free tuition for adults who do not have their Grade 12.
- Building receptor capacity by offering additional internship program opportunities to support jobs for graduates of our numerous post-secondary institutions, who would work in focused areas of research and development with local firms.

- Initiating and sponsoring a community-focused innovation summit(s) to bring together the varied groups that are working to advance innovation at the community level. (Regional Development Authorities, the Nova Scotia Co-op Council, CAP groups, universities/colleges, government and business).
- Improving communications between research institutions and the business community and business support agencies (community and regional development agencies etc.)
- Further encouraging programs like the Science and Technology Collaboration Program currently being offered by Dalhousie University and the NRC-IRAP, which even though small in scale can link SMEs with needed scientific and technical support.
- Creating a provincial funding program designed to help address matching-funding obstacles experienced by SMEs attempting to take advantage of national programs aimed at providing companies with targeted scientific or engineering research support.

2.6 Research Infrastructure Mandate Group: Making the Most of a Solid Foundation

As previously indicated, the Research Infrastructure Mandate group provided recommendations in September 2004 in response to a specific request for Council advice on strategic priorities for future Government of Nova Scotia R&D-related investments. The Mandate Group report formed the basis for the Council response that was issued to the Premier in October 2004. Both the Mandate-Group report and the subsequent Council response focused primarily on issues dealing with provincial government R&D-related matching funding for national research funding programs (most notably the Canada Foundation for Innovation or CFI).

Specific Council recommendations related to the R&D matching-funding issue and the review of the structure of the primary provincial matching-funding-provision mechanism, the Nova Scotia Research and Innovation Trust (NSRIT), were subsequently provided to members of the Council of Nova Scotia University Presidents (CONSUP) in February 2005. The recommendations of the Premier's Advisory Council provided the key components of the initial Government of Nova Scotia position for the current, ongoing discussions with CONSUP on the R&D-related aspects of the December 2004, CONSUP-Government of Nova Scotia Memorandum of Understanding.

These recommendations contained in the October 2004 response to the Premier on the matching-funding/NSRIT issue focused on three primary areas; principles, approach and governance and priority setting.

Recommendations

Principles: It was recommended that the following three basic principles be upheld as **requirements** for funding from the province:

- Excellence of research, as indicated by the previous track record of the researchers, *i.e.* demonstrated success, or potential for success.
- A high degree of relevancy and probability of potential socio-economic benefits of the proposed research, such as:
  - Significant potential for commercialization.
  - Potential benefit to Nova Scotia.
- Creation or strengthening of research and development capacity within Nova Scotia through research collaborations and partnerships.

The following **additional** principles were also recommended:

- That the proposed research build research capacity, including the training of highly qualified personnel and establishment or enhancement of a critical mass of researchers in that research area.
- That the ability to leverage additional funding be considered favourably.

Approach/Governance: In recognition of the need for a more proactive, coordinated relationship between the Government of Nova Scotia and universities and colleges on the research funding issue, the following recommendations were made:

- Continued meetings of provincial deputy ministers and university presidents to discuss common issues of interest, including research matters.
- Improved ongoing information flow and consultation between the university/college research community and the Province on institutional research project plans and government priorities and directions.
- The development and sharing of joint data bases which would include information on current research activities, areas of institutional focus and activity, specific projects as well as data on the skills of the researchers and their contact information.
- Improved linkages between the university research community and the private sector, including:
  - Private sector access to the databases described above.
  - Improved awareness through the promotion of enhanced, plain language presentation of institutional research activities and capabilities.
  - Increased opportunities for academic-business internship placements.
- The continued use of the NSRIT as the primary vehicle for provision/disbursement of Government of Nova Scotia R&D matching funding, with NSRIT membership expanded to include private sector representatives through industry associations.

Priority Setting: With respect to setting priorities based on sectors or specific areas of research the following recommendations were issued:

- That provincial matching funding provisions be based on the principles identified above, and not otherwise be limited by sector.
- That, of the CFI programs, the CFI New Opportunities and Canada Research Chairs Infrastructure grants receive NSRIT funding priority, in order to support the future growth of the Nova Scotia research community.

Along with the specific recommendations above, it was also recommended that the Government of Nova Scotia should consider developing a broader strategic and coordinated approach to advancing R&D activity in this province. This strategic approach, in the view of Council, is required to help expand current research capacities and levels of activity, but more importantly, to maximize the future potential socio-economic benefits enhanced R&D activity holds for all Nova Scotians. It is also recommended that the province needs to identify areas of potential strategic importance and communicate these widely among the research community and other stakeholders.

3.0 Conclusion and Next Steps for the Council

As indicated, this document represents an initial progress report of Council. Council members look forward to the Government of Nova Scotia response to this report and would welcome an opportunity for further dialogue on its recommendations.

Innovation covers a broad spectrum of issues and areas of potential interest for future Council focus and activity. Council is currently in the process of identifying its go forward agenda. Among issues identified for further consideration are: government procurement as a lever for innovation and economic growth, broader innovation funding issues (use of public pension funds, labour sponsored venture capital funds, etc.), a more in depth look at the R&D tax credit issue and the celebration/promotion of past and present Nova Scotian innovation and innovators. These and other areas will be discussed in detail as Council enters its third year of service towards contributing to the objective of a more innovative and prosperous Nova Scotia.

Appendix 1: Council Membership

- Chair: Dr. Kelvin Ogilvie, Acadia University
- Steven Ashton, Aliant Inc.
- Myrna Breen
- Louis Deveau, Acadian Seaplants Ltd.
- Malcolm Fraser, ISL Internet Solutions.
- Dr. George Iwama, Acadia University
- Dianne Kelderman, Nova Scotia Co-operative Council/Atlantic Provinces Chamber of Commerce.
- Dr. Sandy MacEachern, St. Francis Xavier University
- Bill McMullin, Business Consultant
- Hugh Roddis, Founder, Orion Electronics Limited
- Dr. Jacqueline Thayer Scott, Cape Breton University/ Deputy Chair, Prime Minister's Advisory Council on Science and Technology
- Dr. Mary Anne White, Dalhousie University
- Paul Taylor, Office of Economic Development, (Ex officio member)
- Dan MacDonald, InNOVAcorp, (Ex officio member)